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LADEE Mission Set for Friday at 10:27 p.m. CDT

By Shannon Ridinger

NASA's Lunar Atmosphere and Dust Environment Explorer (LADEE) spacecraft is gearing up for its mission to the moon where it will gather detailed information about the structure and composition of the lunar atmosphere, conditions near the surface and environmental influences on lunar dust. A thorough understanding of these characteristics of our nearest celestial neighbor will help researchers understand other bodies in our solar system.



The LADEE spacecraft in the nose cone at the top of the full Minotaur V launch vehicle stack. (NASA/Wallops/Terry Zaperach)

See LADEE Launch on [page 2](#)

Sensor Testing Complete on Cryogenic Composite Tank

By Shannon Ridinger

A team of engineers at NASA's Marshall Space Flight Center recently conducted advanced structure sensor testing on a carbon composite cryogenic tank. Composite cryogenic tanks are fuel storage tanks made of a carbon composite, which is lighter than the metal from which traditional tanks are built. These new tanks could reduce cost and weight significantly for future



The composite cryogenic tank during a recent test at the Marshall Center. (NASA/MSFC)

See [Sensor Testing](#) on [page 3](#)

NASA's Fermi Celebrates Five Years in Space, Enters Extended Mission

From Headquarters News Release

During its five-year primary mission, NASA's Fermi Gamma-ray Space Telescope has given astronomers an increasingly detailed portrait of the universe's most extraordinary phenomena, from giant black holes in the hearts of distant galaxies to thunderstorms on Earth.

But its job is not done yet. On Aug. 11, Fermi entered an extended phase of its mission -- a deeper study of the high-energy cosmos. This is a significant step toward the science team's planned goal of a decade of observations, ending in 2018.

From blazars to thunderstorms, [this video](#) showcases highlights from the Fermi Gamma-ray Space Telescope's first five years in space.

"As Fermi opens its second act, both the spacecraft and its instruments remain in top-notch condition and the mission is delivering outstanding science," said Paul Hertz, director of NASA's astrophysics division in Washington.

See *Fermi* on [page 5](#)

LADEE Launch *Continued from page 1*

LADEE is scheduled to launch on top of an Orbital Minotaur V launch vehicle from the Wallops Flight Facility at 10:27 p.m. CDT, Sept. 6. The mission is the first spacecraft designed, developed and built at NASA's Ames Research Center. The robotic mission is led by Ames, managed out of the Lunar Quest Program Office at NASA's Marshall Space Flight Center, and funded by NASA's Science Mission Directorate.

Approximately one month after launch, LADEE will begin its 40-day commissioning phase during which the spacecraft will be performing activities high above the moon's surface. These activities include checking out the spacecraft's instrument suite and testing a high-data-rate laser communication system, managed by NASA's Goddard Space Flight Center, that will enable higher rates of satellite communications similar in capability to high-speed fiber optic networks on Earth.

After commissioning, LADEE will maneuver to a lower altitude above the moon's surface and begin the mission's 100-day science phase to collect data using three instruments to determine the composition of the thin lunar atmosphere and remotely sense lofted dust, measure variations in the chemical composition of the atmosphere, and collect and analyze samples of any lunar dust particles in the atmosphere. Using this set of instruments, scientists hope to address a long-standing question: Was lunar dust, electrically charged by sunlight, responsible for the pre-sunrise glow above the lunar horizon detected during several Apollo missions?



A full view of the Minotaur V with the LADEE spacecraft on top in the nose cone. LADEE will launch Sept. 6 at 10:27 p.m. CDT. (TASC, Inc./Jim Nierstedt)

Marshall employees and the general public can follow launch activities in several ways. It will be broadcast live on [NASA TV](#) or on the Web via the [NASA TV UStream](#). NASA [social](#) accounts, including [@NASALADEE](#) and [@NASA_Marshall](#), will have the latest information before, during and after the launch. The [LADEE](#) and [Wallops](#) Web pages will also have the most current information including official [public viewing sites](#) if you do happen to be in the area.

For launch viewing maps, animations, pictures and more on LADEE, visit <http://moon.nasa.gov/home.cfm>.

Ridinger is a public affairs officer in the Office of Strategic Analysis & Communications.

Save the date: Innovation & Technology Day Sept. 12

The Marshall Space Flight Center will recognize the importance of collaboration during the annual Innovation & Technology Day Expo on Sept. 12.

The event, open to badged employees of Marshall and Redstone Arsenal, is a daylong expo hosted in Activities Building 4316 showcasing the pioneering technology and developments by various groups across the Marshall Center. The event provides a “show-and-tell” opportunity for the NASA and Redstone Arsenal workforce to learn about -- and potentially benefit from -- another organization’s work.

The event is hosted by Marshall’s Office of the Chief

Information Officer, Office of Strategic Analysis & Communications, and Office of the Chief Technologist.

The expo will feature live demonstrations and hands-on exhibits of the center’s technical capabilities and expertise. NASA employees who are unable to attend are invited to watch Marshall Television’s live coverage on [DesktopTV](#).

Activities run from 10 a.m. until 3 p.m. Lunch vendors will be on-site and buses to certain buildings will provide local transportation to and from the expo. For the latest information, including bus schedules, visit [ExplorNet](#).

Sensor Testing *Continued from page 1*

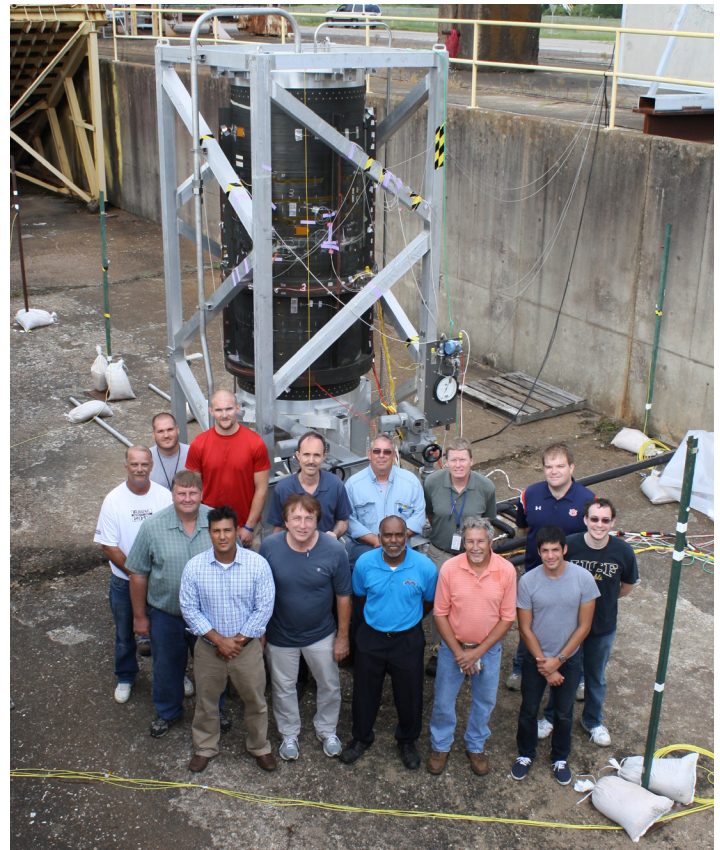
spacecraft.

The tank, which is 42 inches in diameter, 96 inches in height and has a capacity of 500 gallons, was covered with several types of sensors designed to monitor structural integrity and state of health during the test. It then was filled with liquid nitrogen and pressurized until it burst, all while collecting data from the various sensors. This data could be used to design future “smart” cryogenic composite tanks that would have these types of sensors embedded into their structure allowing for easier maintenance and gathering of data.

“This testing was a great example of team work, both within our own Marshall team and with NASA’s Kennedy Space Center, the lead center on this project,” said Karen Knight, Advanced Exploration Systems integration lead at the Marshall Center. “We are pleased with how the test went, and it will be exciting to really dig in and analyze this data to see how it may affect design and development of future composite cryogenic tanks.”

Composite cryogenic tanks could be used to carry fuel for future vehicles, like the Space Launch System, the heavy-lift rocket NASA is currently designing that is managed by Marshall. The recent testing was part of a structural health monitoring study funded by NASA’s Advanced Exploration Systems program and led by Kennedy.

Ridinger is a public affairs officer in the Office of Strategic Analysis & Communications.



The Marshall team that conducted the testing with the composite cryogenic tank, gathering before the test. Front row, from left, Jim Sisco, Demerits Mitsakos, Rudy Werlink, Curtis Banks, WA Crawford and AJ Modesto. Back row, from left, Chris Conn, Dwight Mason, Daniel Clanton, Geoff Rowe, Terry Leibold, Matt Miles, Rush Elkins and Hugo Ferstadt. (NASA/MSFC)

NASA Honors 13 Marshall Team Members with Silver Snoopy Award

On Aug. 28, 13 NASA Marshall Space Flight Center team members were honored with the NASA Silver Snoopy award for their outstanding achievements to human flight safety or mission success. The Snoopy represents the astronauts' own recognition of excellence. NASA astronauts Jeff Williams and Jack Fischer and Marshall Center Director Patrick Scheuermann presented the awards. For more information on the Silver Snoopy award, visit [here](#).



From left, first row, astronaut Jack Fischer; and honorees Kenneth G. Cooper, Propulsion Systems; Angela T. Haddock, Mission Operations Laboratory; Keith Brockway, Communication Services Office; Kathryn Huffman-Graham, Chief Engineers' Office; astronaut Jeff Williams; second row, Robert R. Hickman, Materials & Processes Laboratory; Kenneth Frederick, Space Systems Department; J.R. Booker, Spacecraft & Vehicle Systems Department; third row, Marshall Center Director Patrick Scheuermann. (NASA/MSFC/Fred Deaton)



From left, first row, astronaut Jack Fischer; and honorees Jason Turpin, Space Systems Department; Mardi M. Wilkerson, Mission Operations Laboratory; Andrea E. Nunn, Office of the Chief Information Officer; Linda S. Southworth, Office of Strategic Analysis & Communications; astronaut Jeff Williams; second row, Vinay Patel, Applications Architecture & Strategy Office; Randal McNichol, Space Systems Department; third row, Marshall Center Director Patrick Scheuermann. (NASA/MSFC/Fred Deaton)

Marshall Aero-M Team Readies Aerial Vehicles for Competition

To give young engineers an opportunity to apply NASA's systems engineering practices and review system on a small technical project from start to finish, NASA is hosting an internal competition among teams at NASA's Marshall Space Flight Center, Johnson Space Center and Kennedy Space Center. Marshall team members, from left, Aero-M project lead Adam Kimberlin, Chris Becker, Tiffany Russell, Aero-M team mentor Jim Snoddy, Robert Parker, Garrick Merrill and Peter Ma completed a pre-flight readiness review last week for the vehicles shown here. The small multidisciplinary team, called Aero-M, involved engineers from every Marshall engineering department in this NASA Academy of Program/Project & Engineering Leadership (APPEL) training activity. On Sept. 11, some of the team members will be at Kennedy Space Center for a competition that judges their implementation of systems engineering practices as well as the performance of their aerial systems.



Redstone Arsenal to Implement New Procedures and Technologies at Access Control Points

To improve security on Redstone Arsenal, guards at access control points have begun using new technologies and procedures to ensure that each entrant is properly cleared to enter the installation.

In the first month of his command, Col. Bill Marks, garrison commander of Redstone, assessed that “our gate procedures aren’t at an acceptable level to keep our arsenal secure. While employee convenience is

important, safety and security are our top priorities.”

Gate guards have begun fielding new equipment that will assist them to spot counterfeit badges and expired or revoked credentials. Guards have been training with the new equipment and are becoming more proficient with its use.

“Every day, those who would do us harm are

*See **Redstone Arsenal Procedures** on [page 6](#)*

Fermi *Continued from [page 2](#)*

Fermi has revolutionized our view of the universe in gamma rays, the most energetic form of light. The observatory’s findings include new insights into many high-energy processes, from rapidly rotating neutron stars, also known as pulsars, within our own galaxy, to jets powered by supermassive black holes in far-away young galaxies.

The Large Area Telescope, the mission’s main instrument, scans the entire sky every three hours. The state-of-the-art detector has sharper vision, a wider field of view and covers a broader energy range than any similar instrument previously flown.

Fermi’s secondary instrument, the Gamma-ray Burst Monitor, managed at NASA’s Marshall Space Flight Center, sees all of the sky at any instant, except the portion blocked by Earth. This all-sky coverage lets Fermi detect more gamma-ray bursts, and over a broader energy range, than any other mission. These explosions, the most powerful in the universe, are thought to accompany the birth of new stellar-mass black holes.

“More than 1,200 gamma-ray bursts, plus 500 flares from our sun and a few hundred flares from highly magnetized neutron stars in our galaxy have been seen by the Gamma-ray Burst Monitor,” said principal investigator Bill Paciesas, a senior scientist at the Universities Space Research Association’s Science and Technology Institute in Huntsville.

The instrument also has detected nearly 800 gamma-ray flashes from thunderstorms. These fleeting outbursts last

only a few thousandths of a second, but their emission ranks among the highest-energy light naturally occurring on Earth.

One of Fermi’s most striking results so far was the discovery of giant bubbles extending more than 25,000 light-years above and below the plane of our galaxy. Scientists think these structures may have formed as a result of past outbursts from the black hole -- with a mass of 4 million suns -- residing in the heart of our galaxy.

To build on the mission’s success, the team is considering a new observing strategy that would task the Large Area Telescope to make deeper exposures of the central region of the Milky Way, a realm packed with pulsars and other high-energy sources. This area also is expected to be one of the best places to search for gamma-ray signals from dark matter, an elusive substance that neither emits nor absorbs visible light. According to some theories, dark matter consists of exotic particles that produce a flash of gamma rays when they interact.

NASA’s Fermi Gamma-ray Space Telescope is an astrophysics and particle physics partnership. NASA’s Goddard Space Flight Center manages the mission. The telescope was developed in collaboration with the U.S. Department of Energy’s Office of Science, with contributions from academic institutions and partners in the United States, France, Germany, Italy, Japan and Sweden.

To view a video overview of the Fermi Gamma-ray Space Telescope, visit [here](#).

Marshall Center Team Members Show Team Pride, Face Off in 2013 Team Pride Social and Dip Challenge



Ready for the competition, Marshall team members Laura Hardin, left, and Whitney Young prepare their Alabama vs. Auburn table for the 2013 Team Pride Social and Dip Challenge on Aug. 29 in the Activities Building at NASA's Marshall Space Flight Center. Marshall team members were encouraged to wear their favorite sports team colors and enter a center-wide competition for the best tasting dips and desserts judged by co-workers who attended. Winners in the dessert category were, 1st place, Tina Walker's Peach Danish Delight; 2nd place, Angie Daniels' Tailgate Bark; and 3rd place, Judi Hollingsworth's Aunt Judi's Chocolate Chip Cookies. Winners in the dip category were, 1st place, Darius Yaghoubi's Bodacious Buffalo Chicken Dip; 2nd place, Duane Burdick's Unbelievable Whoda Thunk; and 3rd place, Stacy Counts' Sweet 'n Spicy Cocoa Rub Dip. (NASA/MSFC/Fred Deaton)

Sporting a New Orleans Saints jersey, Marshall Center Director Patrick Scheuermann addresses Marshall team members at the 2013 Team Pride Social and Dip Challenge event Aug. 29. Many Marshall employees proudly showed their support for their favorite sports team by wearing their team colors. The event was hosted by the Marshall Exchange. (NASA/MSFC/Fred Deaton)



Redstone Arsenal Procedures *Continued from page 5*

changing their tactics and techniques," said Marks. "We have to adapt as well. As new technologies become available to us, we must take advantage of them to maintain our security posture."

As part of the overall safety plan, the gate guard force regularly changes its procedures to reduce predictability for adversaries.

"Redstone is a unique installation, as we all know," said Marks. "We have equipment, knowledge and resources that are critical to our nation's security. It's an awesome task to ensure that we operate as safely

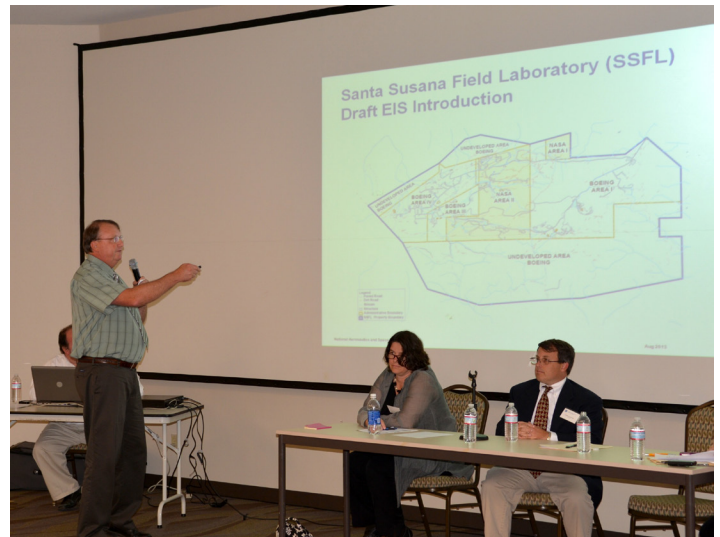
and securely as we possibly can."

Officials note that the workforce and customers can assist the process by adjusting their travel routines, having their credentials ready when they approach a gate and to remain patient as they commute.

"As resources become more and more scarce, we'll continue to adjust our procedures," said Marks. "We're always exploring ways to improve our gate efficiency and effectiveness while maintaining security."

Santa Susana Draft Environmental Impact Statement Open for Public Comment

Allen Elliott, NASA program director for NASA's Santa Susana Field Laboratory, presents an overview of the NASA Draft Environmental Impact Statement on Aug. 27 at a public meeting in West Hills, Calif., to solicit comments. The draft impact statement is designed to inform the public of the potential environmental consequences of the proposed demolition of Santa Susana structures and proposed groundwater and soil remediation actions. The Santa Susana Field Laboratory is located on 450 acres 30 miles from downtown Los Angeles and was a site for rocket engine testing during the Apollo and Space Shuttle programs. The final space shuttle main engine test took place there in 2003. NASA is committed to environmental cleanup of the site, which is now inactive. NASA's Marshall Space Flight Center manages Santa Susana for the agency. For more information about Santa Susana or to read the complete impact statement, visit [here](#). The public comment period closes on Oct. 1. (NASA/Santa Susana/Merrilee Fellows)



3-D Printed Engine Part Blazes to Life on NASA-TV

The largest 3-D printed rocket engine component NASA has ever test-fired is featured in the latest edition of "This Week @NASA," a weekly video program broadcast on NASA-TV and posted online. Marshall engineers tested an injector, the part which delivers propellants to power rocket engines providing the thrust necessary to send rockets to space.

The firing generated 20,000 pounds of thrust, 10 times more than with any injector previously made using additive manufacturing, or 3-D printing. Marshall engineers are designing, manufacturing, and testing 3-D printed rocket parts to see if this new fabrication process can make parts that endure the harsh conditions experienced during a rocket launch. Experts estimate that rocket parts



made using this process could reduce the cost for producing engine components. You can watch this edition of This Week @NASA at the [NASA-TV YouTube channel](#).

Obituaries

Elizabeth Silver Colson, 71, of Huntsville, died Aug. 15. She retired from the Marshall Center in 1978 as a secretary.